

CABINET-REAR VIEW DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

Remove five screws holding cabinet back and remove cabinet back. Remove knobs from cabinet.

Disconnect picture-tube socket, high-voltage anode lead, speaker leads, and ground strap. Loosen screw holding yoke.

Remove three screws holding tuner assembly. Slide chassis and tuner assembly from the cabinet front.

PICTURE TUBE REMOVAL

Follow Chassis Removal procedure and lay set face down on a soft protective surface.

Remove four screws holding picture tube retaining wire. Lift out the picture tube. Do not lift picture tube by the neck.

SERVICING IN THE FIELD

CRT IMPLOSION PROTECTION AND CLEANING

Implosion protection is an integral part of the picture tube, cleaning accomplished without CRT removal.

FUSE DEVICES

A 4-amp fuse is used for AC line protection. (See photo, Cabinet-Rear View.)

VHF TUNER

Set fine tuning at the center of its range and adjust oscillator slug (one for each channel) for best sound and picture.

HORIZONTAL OSCILLATOR

Adjustment of the horizontal hold is accomplished by the proper setting of the horizontal hold coil. (See photo, Cabinet-Rear View.)

WIDTH

The width may be varied by connecting the lead from R270 to various voltage points. (See photo, Cabinet-Rear View.)

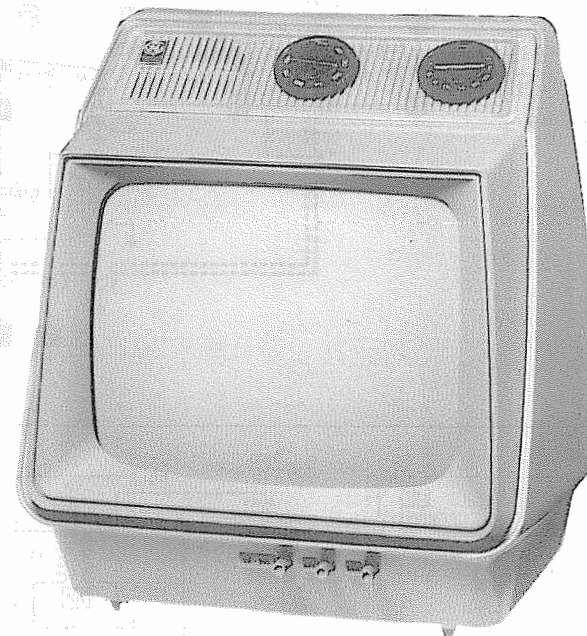
CENTERING

Centering is accomplished by proper adjustment of two magnetic rings located on the yoke rear cover.

PHOTOFACT® Folder with CIRCUITRACE

For Supplier Address See PHOTOFACT Index

GENERAL ELECTRIC CHASSIS
9SF, 12SF, 15SF



MODEL SF1600BG

MODEL	CHASSIS
SF1600BG	9SF
SF1601AM	9SF
SF1602AV, TG, VY	9SF
SF1608VY	9SF
SF2100AM, GY	12SF
SF2101AV, GD	12SF
SF2103BR	12SF
SF2105EB	12SF
SF2106VY	12SF
SF2107CG	12SF
SF2110BK	12SF
SF2118BK	12SF
SF2204WD	12SF
SF2208WD	12SF
SF2306WD	12SF
SF2310WD	12SF
SF3102VY	15SF
SF3108BK	15SF
SF3110BK	15SF
SF3202BW	15SF
SF3206WD	15SF

SAFETY PRECAUTIONS

Make sure line voltage does not exceed rating of set. Check high-voltage regulation and adjust to correct value. Be sure shields and rear cover are in place and secure.

Beware of shock from high voltage or AC line. Discharge high voltage to HV cage only.

Use extreme care when handling picture tube. Do not bump, scratch, or exert undue strain.

CAUTION: One side of AC line connected to chassis. Use isolation transformer for servicing. Make certain isolation networks are in place and exposed metal is safe to touch before returning set to customer.

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HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46206

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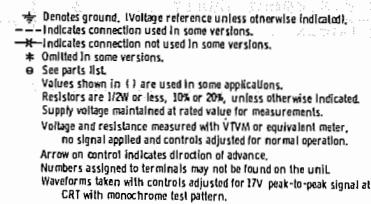
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DATE 11-73

SET 1354 FOLDER 2

GENERAL ELECTRIC CHASSIS
9SF, 12SF, 15SF

SET 1354 FOLDER 2

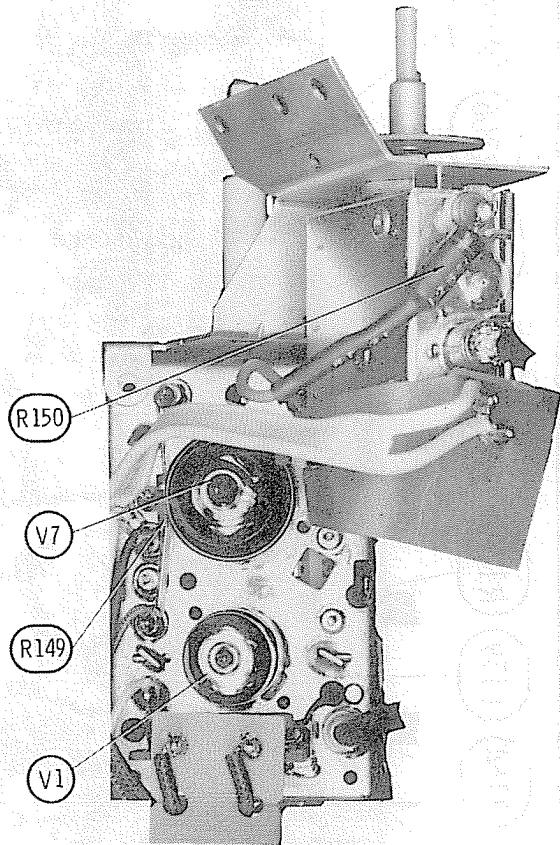


RESISTANCE MEASUREMENTS

ITEM	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9	PIN 10	PIN 11	PIN 12	PIN 13	PIN 14
V1 - VHF	0Ω	1meg	0Ω	1Ω	1300Ω †	0Ω	0Ω			1630Ω †	300Ω *	28Ω		
V2	24Ω	3500Ω †	530Ω †	700K	0Ω	1.7meg	130Ω †	22K †	0Ω	1meg	2100Ω †	14Ω		
V3	24Ω	130Ω †	NC	INF	12Ω †	NC	NC	0Ω	1meg	1meg	0Ω	14Ω		
V4	8Ω	1.6meg †	NC	650Ω †	NC	900K	900K	1630Ω †	0Ω	1meg	300K	5Ω		
V5	8Ω	350Ω †	350Ω †	0Ω	.05Ω	56Ω	0Ω	350Ω †	350Ω †	300K				
V6	4700Ω	220K †	5Ω	3Ω	4700Ω	1.2meg †	0Ω							
V7 - VHF	15K	5000Ω †	0Ω	3Ω	1Ω	1000Ω †	1630Ω †	0Ω	220K					
MEASUREMENTS BELOW TAKEN WITH METER HAVING .08V MAX BETWEEN PROBE TIPS														
IC301	INF	INF	0Ω	0Ω	2000Ω	0Ω	9500Ω	8000Ω	4500Ω	4500Ω	INF	8000Ω	7000Ω	90K
ITEM	E	B	C		ITEM	E	B	C		ITEM	E	B	C	
Q100-UHF	680Ω	2000Ω	8200Ω		Q251	2000Ω	2meg	1300Ω	S	Q301	220Ω	8000Ω	20K	
					Q252	1000Ω	1800Ω	250K						

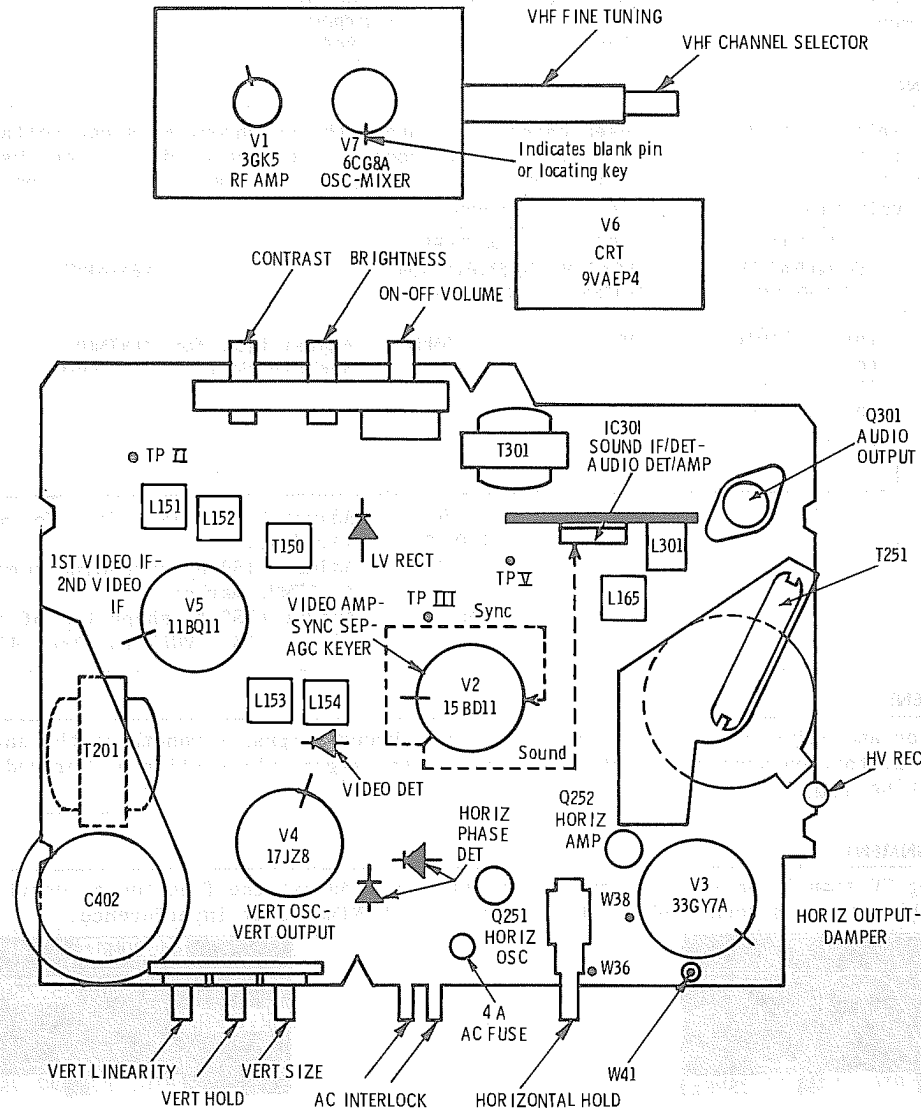
† MEASURED FROM CATHODE OF Y401.
‡ MEASURED FROM PIN 4 OF V3.

* READING DEPENDS UPON POLARITY OF METER CONNECTIONS.
NC NO CONNECTION

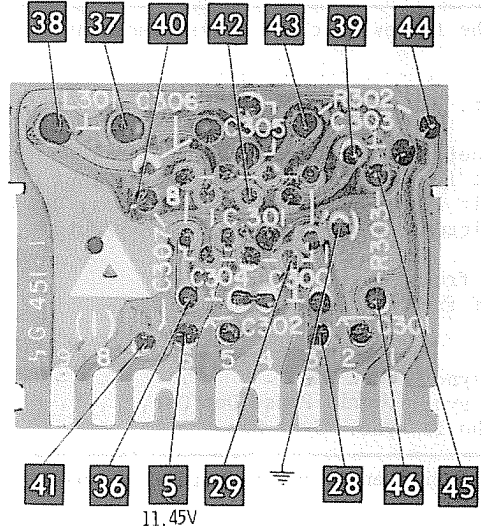
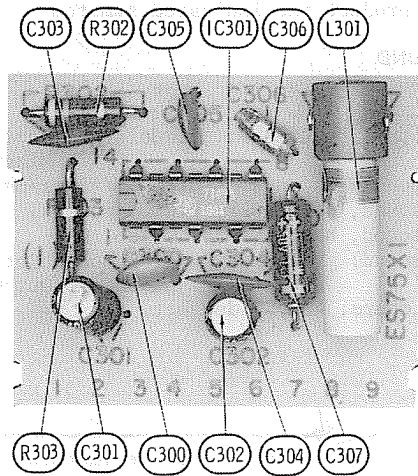


TUNER ASSEMBLY

TRANSISTOR/TUBE PLACEMENT CHART



GENERAL ELECTRIC CHASSIS
9SF, 12SF, 15SF



AUDIO BOARD

A Howard W. Sams CIRCUITRAGE® Photo

FOLDER 2

TV ALIGNMENT INSTRUCTIONS

Use an isolation transformer, or observe polarity, and maintain voltage at 120VAC.
Allow a 20-minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GC ELECTRONICS
L151 thru L154, L301, T150 9440

VIDEO IF ALIGNMENT

Set the channel selector to highest unused channel. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. Use only enough generator output to provide a usable indication. Note: Response may vary slightly from that shown. Connect a -3.5 volt bias to TPII, low side to ground.

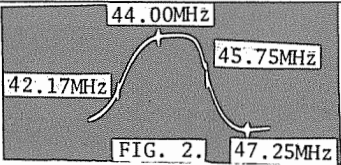
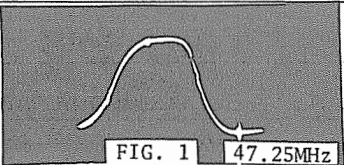
CONNECT SCOPE	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	REMARKS
Vertical input to TPIII, low side to ground.	Thru .001mfd to U on VHF tuner, low side to ground.	44MHz (10MHz Sweep)	47.25MHz	Adjust L151 for MINIMUM. See Figure 1 for response.
"	"	"	42.17MHz 44.00MHz 45.75MHz 47.25MHz (See Fig.2)	Adjust L153, L154, T150 for maximum at 44.00MHz. Adjust L150 by spreading turns to place 42.17MHz marker. Adjust L152 to shape top of response. Adjust L135 (VHF) to place 45.75MHz marker.

SOUND IF ALIGNMENT

Tune in a station and adjust L165 Top for maximum sound. Reduce signal strength at the antenna terminals until distortion appears. Continue to reduce the signal while aligning for undistorted output by adjusting L301.

4.5MHz TRAP ALIGNMENT

Tune in a strong TV signal and set the contrast at maximum. Adjust the fine tuning until a beat pattern is visible on the screen. Adjust L165 Bottom for MINIMUM beat interference.



TROUBLESHOOTING CHECK CHART

The following chart lists component failures most likely to produce the indicated symptom.

SWEEP

No raster, has sound: Horiz Osc/Amp/Output, Damper, HV Rect, CRT
No vert deflection: Vert Osc/Output
Poor vert lin or foldover: Vert Osc/Output
Poor horiz lin or foldover: Horiz Output, Damper
Narrow picture: LV Rect, Horiz Osc/Amp/Output, Damper
Vert off freq: Vert Osc
Horiz off freq: Horiz Phase Det/Osc

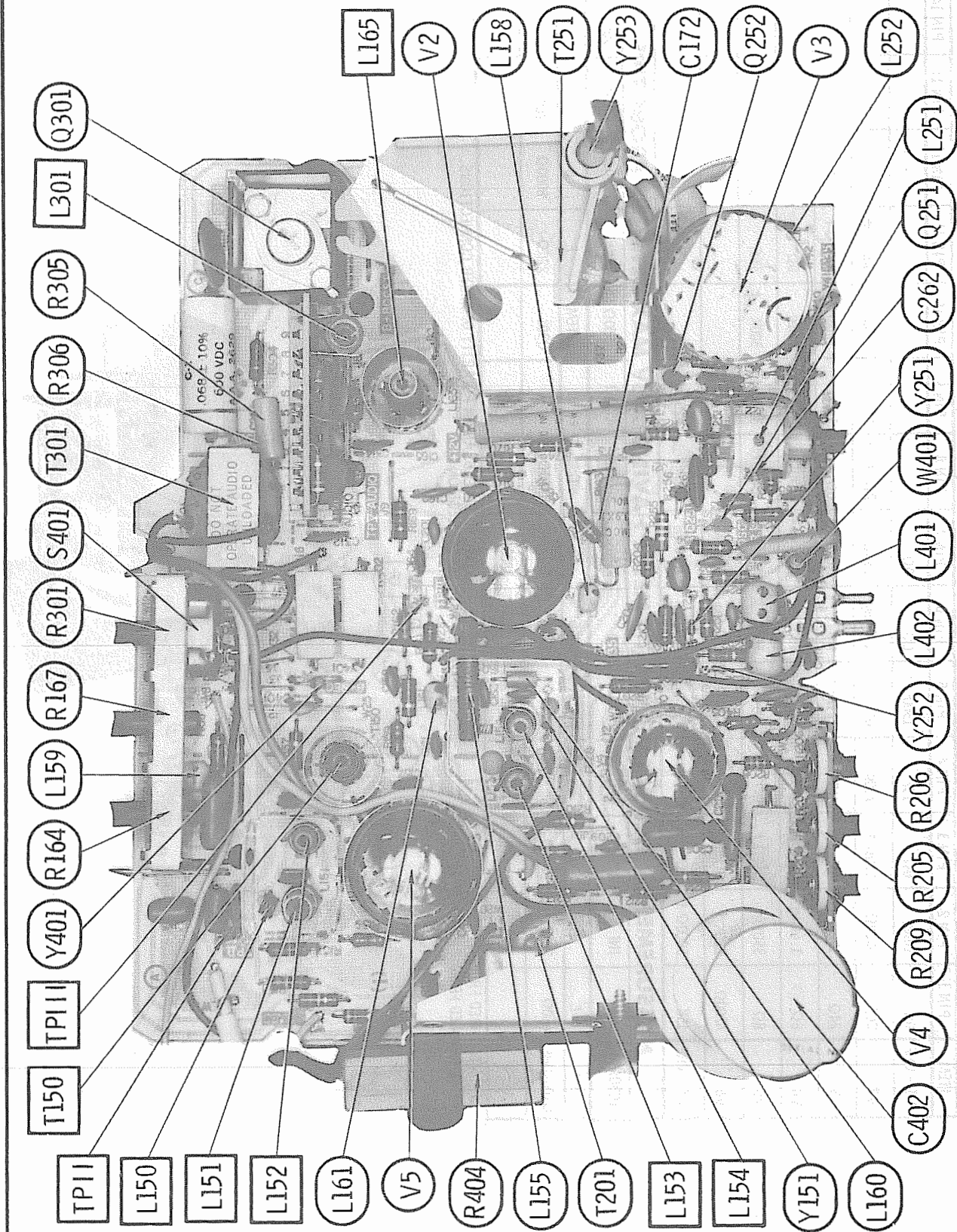
SYNC

No vert sync: Vert Osc
No horiz sync: Horiz Phase Det/Osc
No vert/horiz sync: Sync Sep

PICTURE or SOUND

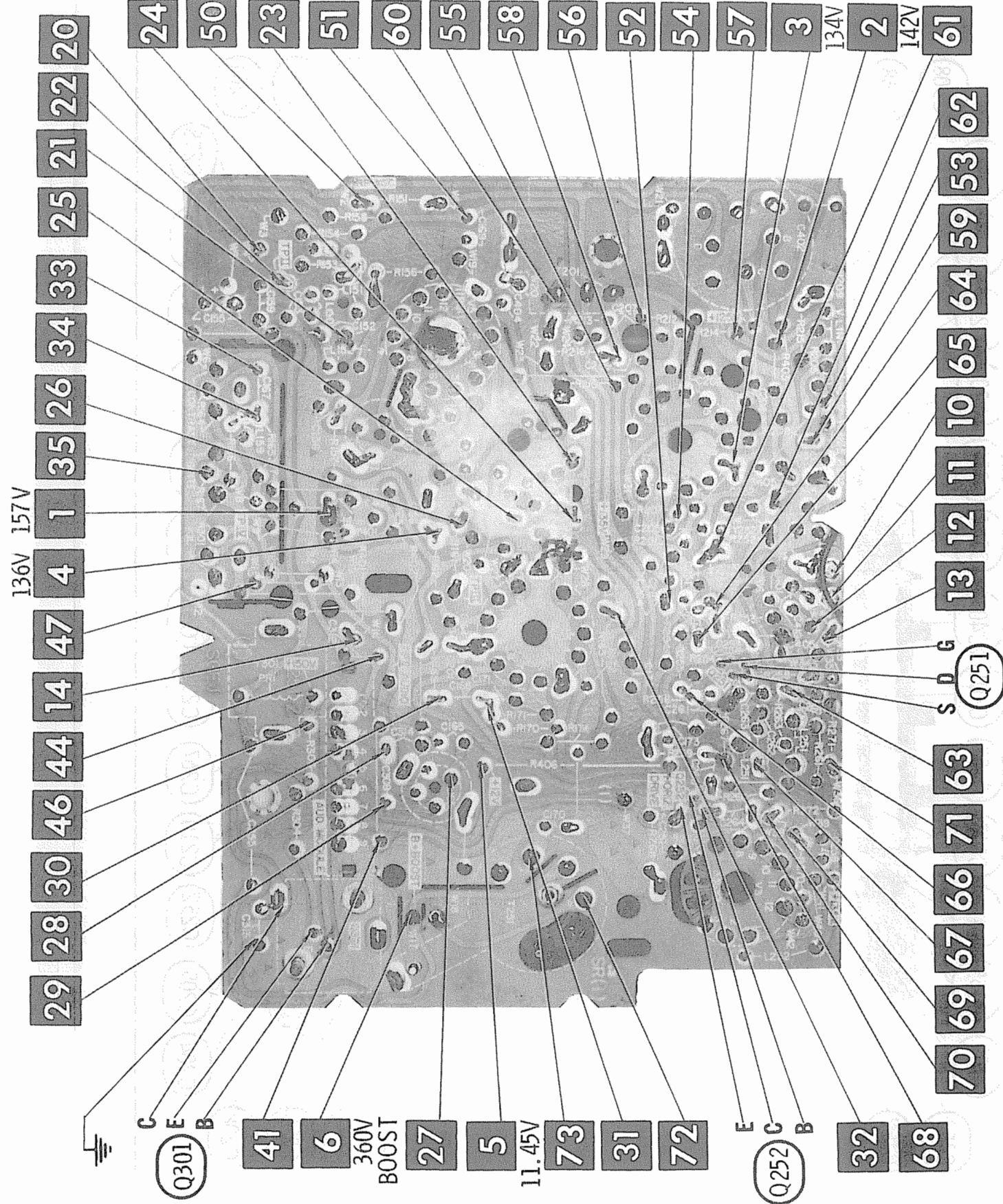
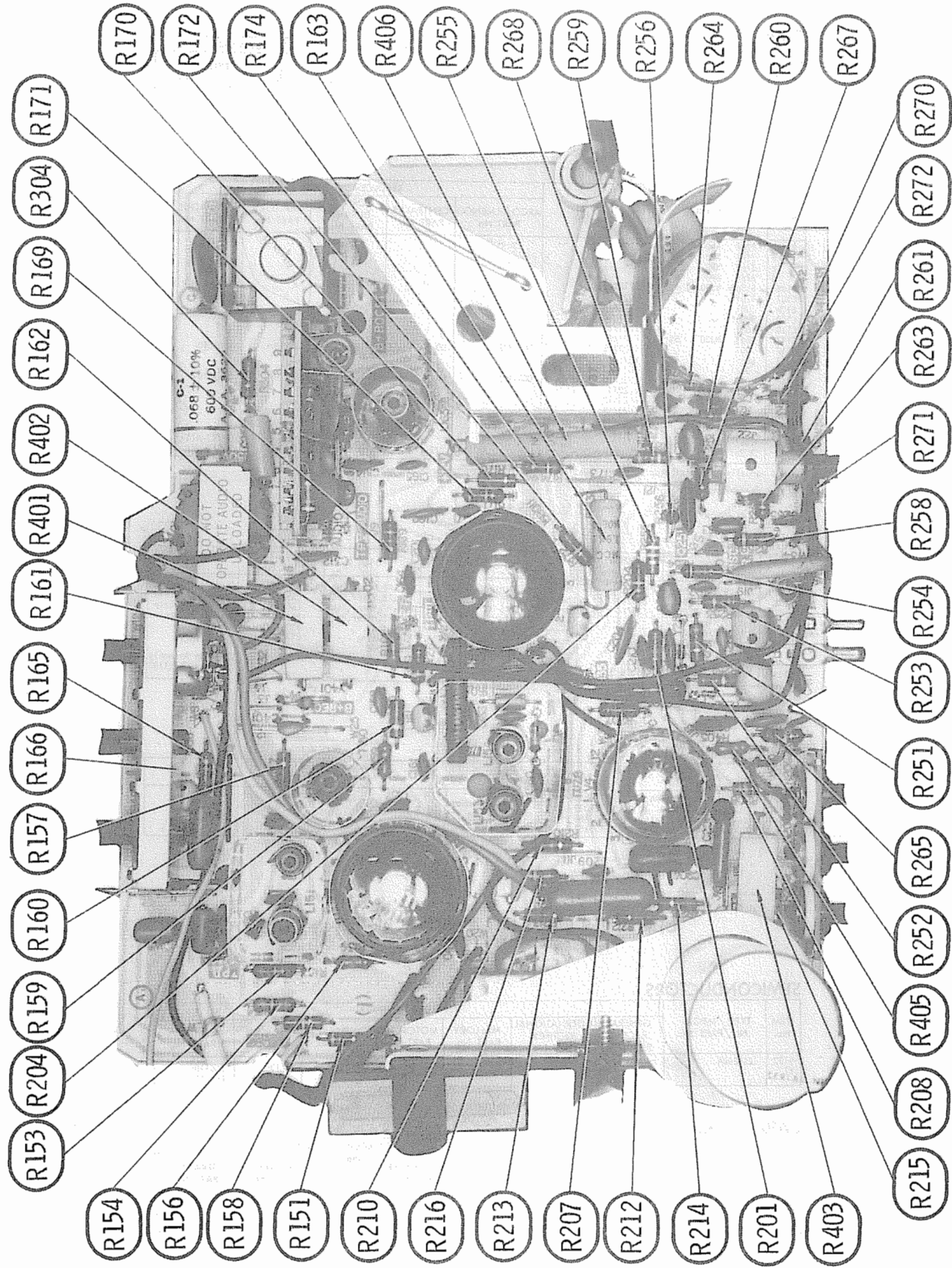
No pic, no sound, no raster: Fuse, LV Rect
No pic, no sound, has raster: Video IFs, Tuner Mixer
No pic, no sound, has snow: Tuner RF/Mixer/Osc.
No pic, has sound, no raster: Video Amp, CRT
No pic, has sound, has raster: Video Amp
Has pic, no sound: Sound IF Det/IF, Audio Det, Audio Amp/Output
Overloaded picture: AGC, Video Det.

A series filament circuit is used; an open filament in any tube will cause the set to be inoperative.

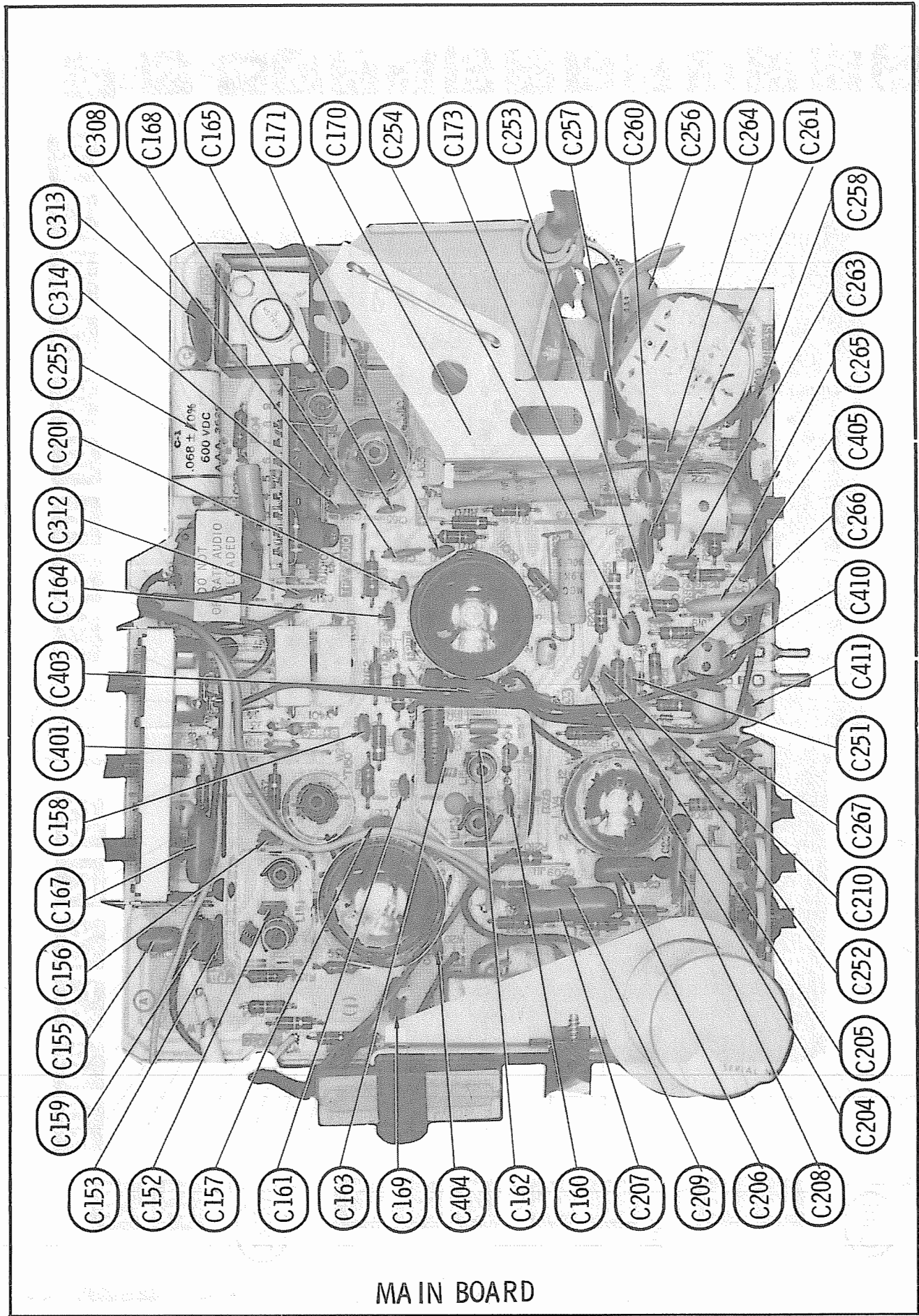


CHASSIS - TOP VIEW

continued on inside cover



MAIN BOARD A Howard W. Sams CIRCUITRACE Photo



VHF TUNER PARTS LIST AND DESCRIPTION
(When ordering parts, state Model, Part Number, and Description.)

AMPEREX			GENERAL ELECTRIC		RCA		SYLVANIA	
ITEM No.	USE		TYPE		ITEM No.	USE		TYPE
V1	RF Amp		3GK5 #		V7	Oscillator - Mixer		6C6BA #

For SAFETY, replace only with equivalent part.

CAPACITORS

ITEM No.	RATING	MFG. PART No.	REPLACEMENT DATA				
			ARCO/ELMENCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C103a	27pf NPO 5%	EU33X63	*			*	10TCS-V6.8
b	27pf NPO 5%						
c	27pf NPO 5%						
d	27pf NPO 5%						
C106	6.8pf N330 ±.5	EP18X604	*				10TCC-V30
C107	47pf	EU23X28					
C108	.001	EU23X13					
C109	3.3pf	ET21X64					
C110	.001	EU23X13	CCO-102	00-102	GP1000	SM210	25S-010
C111	15pf	EU23X7					
C112	.001	EU22X76					
C113	56pf	ES23X3					
C114	.001	EU23X13	CCO-102	00-102	GP1000	SM210	25S-010
C115	.001	EU22X76					
C116	.001	EU22X4					
C117	.001	EU23X13					
C118	.001	EU23X13	*				10TCT-010
C119	.001	EU23X13					
C120	.001	EU23X13					
C121	10pf	N470 ±.5					
C122	2.2pf	NPO		DTZ-2R2	NP02P2	CN0522	10TCC-V22

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

COILS (RF-IF)

ITEM No.	USE	MFG. PART No.	NOTES	ITEM No.	USE	MFG. PART No.	NOTES
L101	Ant, RF, Mixer, Osc.	E562X2	UHF Channel Strip	L110	Ant, RF, Mixer, Osc.	E562X11	Channel 10 Strip
L102	Ant, RF, Mixer, Osc.	E562X3	Channel 2 Strip	L111	Ant, RF, Mixer, Osc.	E562X12	Channel 11 Strip
L103	Ant, RF, Mixer, Osc.	E562X4	Channel 3 Strip	L112	Ant, RF, Mixer, Osc.	E562X13	Channel 12 Strip
L104	Ant, RF, Mixer, Osc.	E562X5	Channel 4 Strip	L113	Ant, RF, Mixer, Osc.	E562X14	Channel 13 Strip
L105	Ant, RF, Mixer, Osc.	E562X6	Channel 5 Strip	L135	IF Output	ET36X775	
L106	Ant, RF, Mixer, Osc.	E562X7	Channel 6 Strip	L138	Fine Tuning	EU37X39	
L107	Ant, RF, Mixer, Osc.	E562X8	Channel 7 Strip	T101	Ant Input	ET62X233	Complete Assembly
L108	Ant, RF, Mixer, Osc.	E562X9	Channel 8 Strip				Includes RC101/02
L109	Ant, RF, Mixer, Osc.	E562X10	Channel 9 Strip				

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M101	Shaft, Fine Tuning	ET69X356	
M102	Cam, Fine Tuning	ET23X23	
RC101	Component Combination	ET33X64	130pf, 1.85-3.5meg
RC102	Component Combination	ET33X64	130pf, 1.85-3.5meg

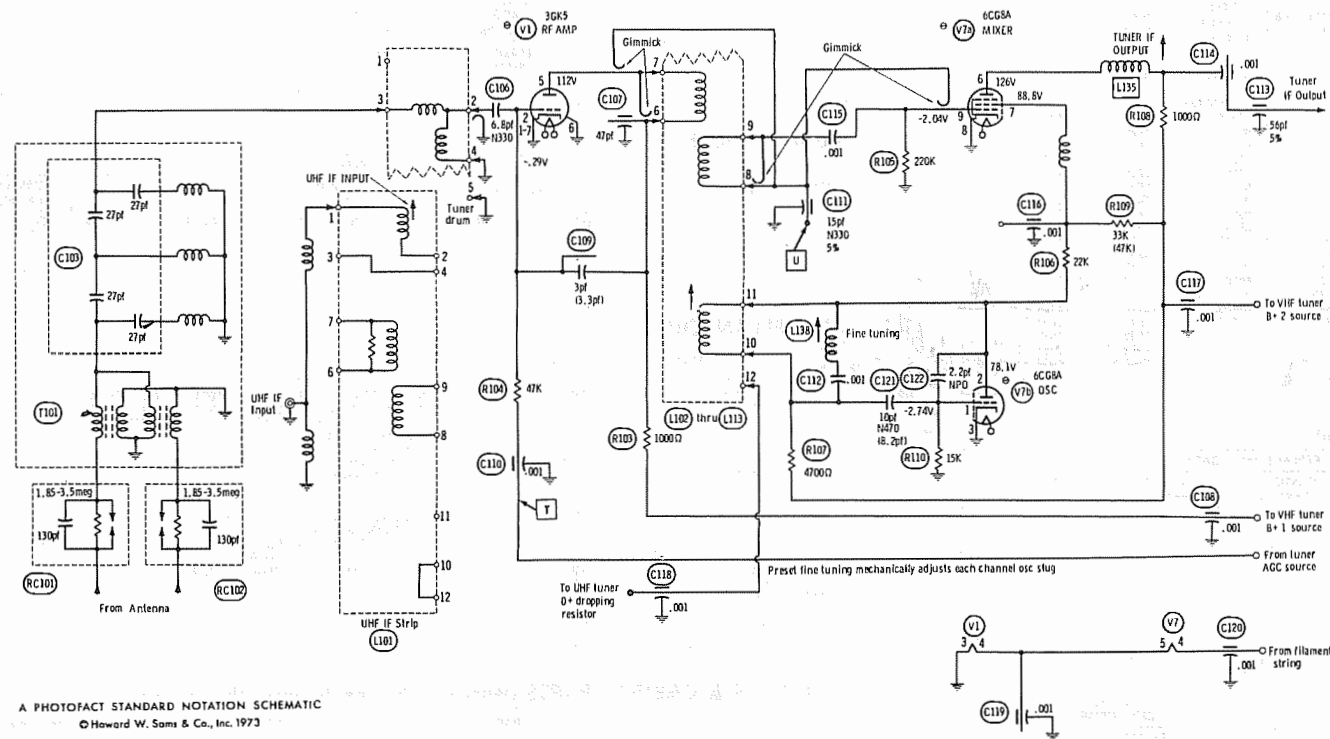
UHF TUNER PARTS LIST AND DESCRIPTION
(When ordering parts, state Model, Part Number, and Description.)

SEMICONDUCTORS

ITEM No.	TYPE / MFG. No. / PART No.	REPLACEMENT DATA						
		GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	MALLORY PART No.	MOTOROLA PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
Q100	25C288A	GE-11	IRTR-83	PTC133	HEP720	SK3019	RT108	ECG 108
Y1		1N82A	1N82AG	PTC217	HEP0700	SK3089		ECG 112

CAPACITORS

ITEM No.	RATING	MFG. PART No.	REPLACEMENT DATA			
			ARCO/ELMENCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.
C2	27pf 5%					
C3	15pf					
C4	.001					
C5	.001					
C6	.001					
C7	.001					



VHF TUNER ALIGNMENT INSTRUCTIONS

OSCILLATOR ADJUSTMENTS

Individual oscillator slugs are accessible through a hole in the front of the tuner. Set the fine tuning at mid-range. Starting with the highest active channel, adjust the appropriate slugs, in descending order, for the best picture and sound.

RF AND MIXER ADJUSTMENTS

Connect the sweep generator across antenna terminals with 120-ohm carbon resistor in each lead. Refer to chart below for generator frequencies. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the scope for horizontal deflection. Unless otherwise noted, connect a variable bias to the RF AGC line at Point T. Adjust bias to obtain response curve showing no overload.

CHANNEL	CONNECT SCOPE	REMARKS
13	Vertical input to point low side to ground.	Expand or compress appropriate coils for maximum gain and symmetry of response similar to Fig. 201 with markers as shown.
12 thru 2	Vertical input to point low side to ground.	Check all channels and make compromise adjustments by expanding or compressing appropriate coils if necessary.

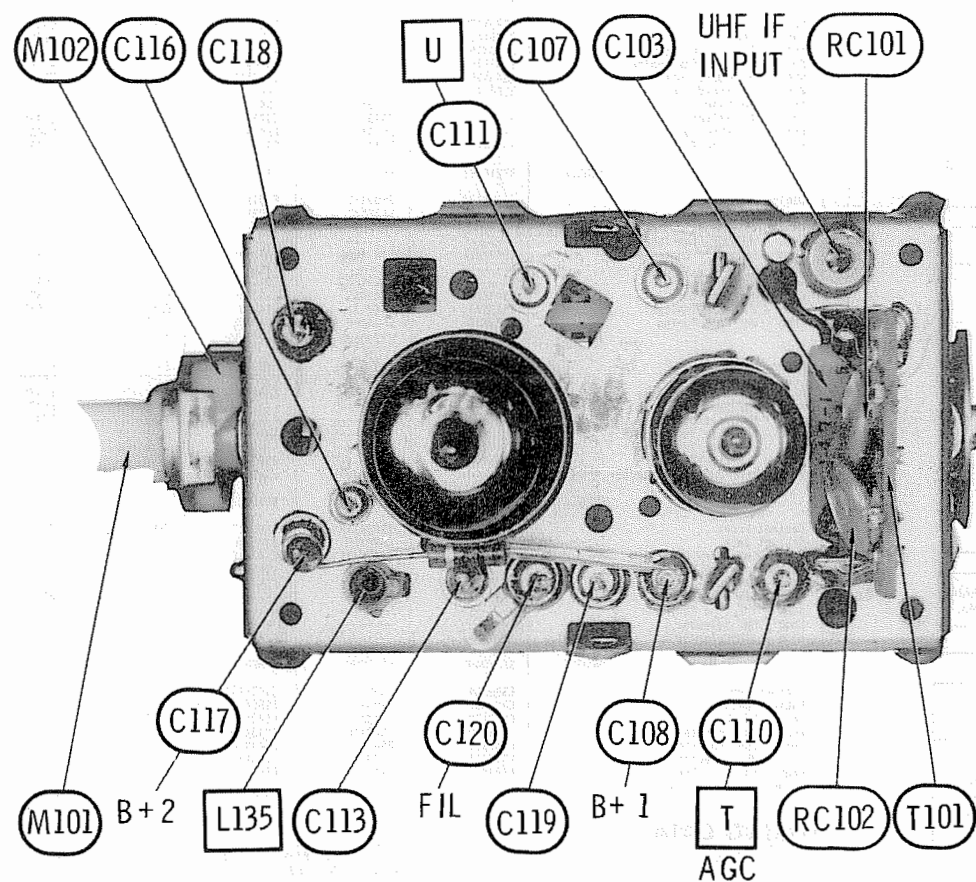
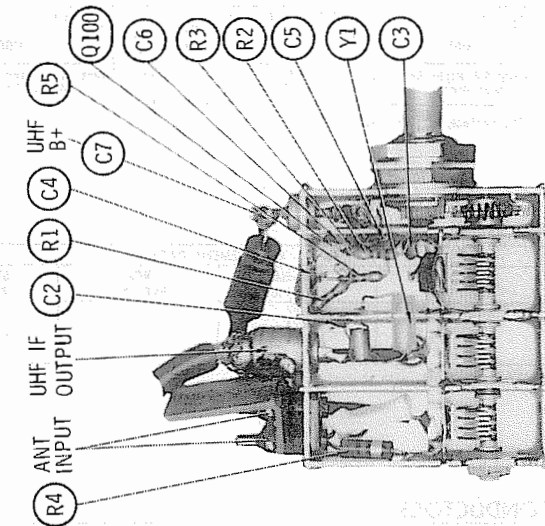
GENERATOR FREQUENCY					
Numbers in () indicate channel number					
SWEEP	MARKER	SWEEP	MARKER	SWEEP	MARKER
(2) 57MHz	55.25MHz	(6) 85MHz	83.25MHz	(10) 195MHz	193.25MHz
	59.75MHz		87.75MHz		197.75MHz
(3) 63MHz	61.25MHz	(7) 177MHz	175.25MHz	(11) 201MHz	199.25MHz
	65.75MHz		179.75MHz		203.75MHz
(4) 69MHz	67.25MHz	(8) 183MHz	181.25MHz	(12) 207MHz	205.25MHz
	71.75MHz		185.75MHz		209.75MHz
(5) 79MHz	77.25MHz	(9) 189MHz	187.25MHz	(13) 213MHz	211.25MHz
	81.75MHz		191.75MHz		215.75MHz

FIG. 201

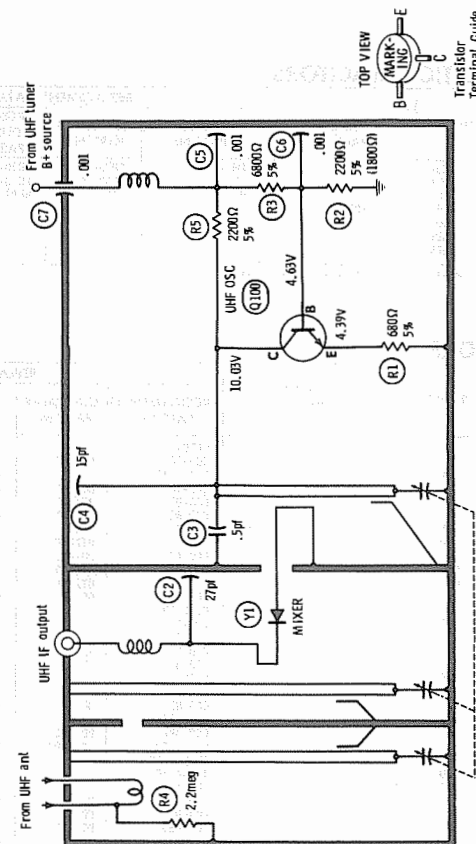
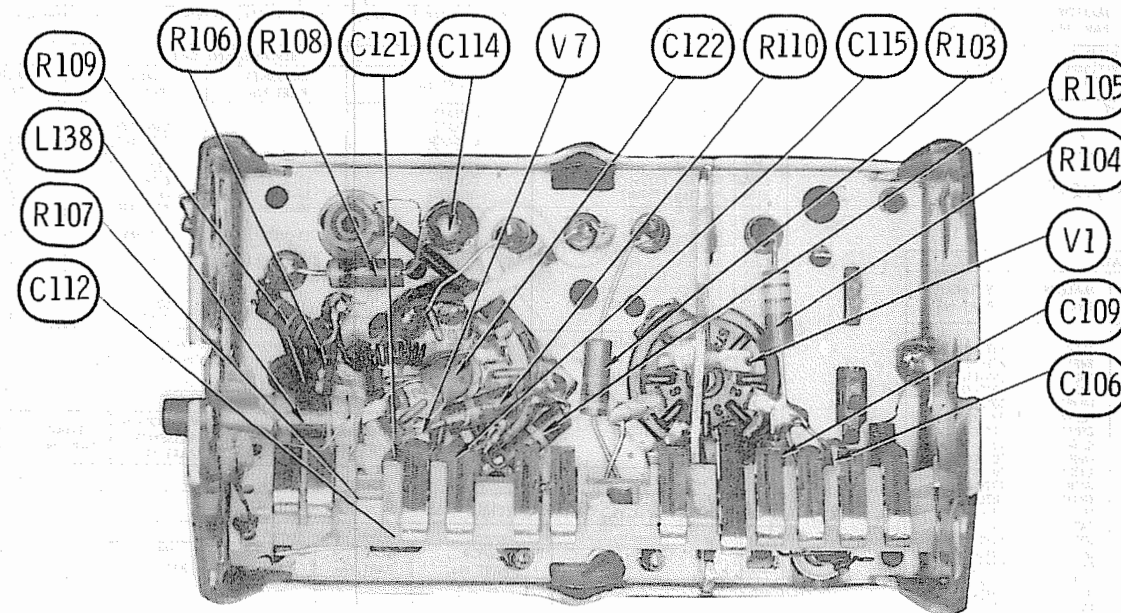
SOUND VIDEO

UHF TUNER ALIGNMENT INSTRUCTIONS

Select a UHF station. Adjust UHF IF input coil for best picture and sound.



VHF TUNER



UHF TUNER

(When ordering parts, state Model, Part Number, and Description.)

TUBES

For SAFETY, replace only with equivalent part.

For SAFETY, replace only with equivalent part.

(1) Silver Screen 85.

* For SAFETY, replace only with equivalent part.

* Part of Audio Module, Part #ES75X1.

For SAFETY, replace only with equivalent part.

8

For SAFETY, replace with equivalent part.

(1) Includes R164, R167 and R301.

(3) Includes R205, R206 and R209.

(4) Alternate Part #E549X89 used in Models SF1608VY, SF2118BK,

1) Used in 9" models.

(2) Used in 12" and 15" models.

For SAFETY, replace only with equivalent part.

(1) Part of Audio Module. Part ES75X1.

ES75X1.

(2) Remove unused terminal

(3) Connect as in original circuit.

TRANSFORMERS (S...

T301	6300	8	ES64X13 #			# For SAFETY, replace onl
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FUSE DEVICES

For SAFETY, replace only with equivalent part.

For SAFETY, replace only with equivalent part.

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869 (17KV) or 8868 (25KV)
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 0730 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
300-Ohm Tuner Input Lead	Use BELDEN No.	8225
300-Ohm Antenna Lead-in	Use BELDEN No.	0238 or 8275
Antenna Rotor Cable	Use BELDEN No.	8484 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8486 (Round) - 8 Conductor